11. *Rennet in Diabetes Mellitus.*—Dr. James Gray, in an interesting paper (*Glasgow Medical Journal*, Oct., 1856), speaks very confidently of the curative powers of rennet in diabetes. He says that he has treated twenty-eight cases by it, and asserts it to be more effectual than any other remedy.

The basis of his theory is, "that if rennet out of the body converts a solution of sugar into lactic acid, it may possess a similar property within the body. Bearing in mind, too, that lactic acid is found in the juice of flesh, and, according to Liebig, is a supporter of the respiratory process, I conceived that if sugar formed in the body of a diabetic patient could be converted by the rennet into lactic acid, it would be burned in the lungs; and that, if a larger quantity were formed than could be consumed in that way, it would be excreted by the kidneys. In this I was not mistaken, for lactic acid was more than once detected in the urine of my first two patients. To say that rennet is an infallible remedy in any or every case of diabetes, would be overrating its virtues. Where this complaint is complicated with organic disease in any organ, the organic disease must be removed before we can look for a cure. It will, at least in such cases, ameliorate the symptoms, mitigate suffering, and tend to lengthen life—the greatest desiderata after an effectual cure. I have been led, from my own personal experience, to classify diabetes under three heads:—

"1. Where the stomach is primarily affected, as has been shown by the experiments of M'Gregor (to whom I am indebted for my first clear views on this disease), and since by Bouchardat, who, as already stated, discovered a substance similar to diastase, and possessing the power of converting starch into sugar.

"2. Where the liver is primarily affected, as has been prominently brought out by the experiments of Bernard. He has shown that, besides its use in the economy as an eliminator of bile, the liver is a sugar-forming agent, and that this power rests with the tissue of the organ, which seems to act the part of a ferment on the nitrogenous fluid circulating in the body, and from which sugar is eliminated; thus one equivalent of protein, fifty-two of oxygen, and four of water may be represented by two equivalents of grape sugar, three of urea, and eighteen of carbonic acid.

"In support of such a doctrine, I may state that I have kept patients for weeks on a strictly animal diet, where not a single atom of starch or sugar was taken, and where not a particle of sugar could be detected in the feces, and yet sugar was excreted with the urine in large quantities.

"3. Where both stomach and liver are simultaneously affected.

"I am inclined to term the first diabetes gastricus; the second, diabetes hepaticus; and the third, diabetes gastro-hepaticus; and have adopted such a division the more, that it does not locate the disease in one special organ, believing, as I do, that something of truth may be found on either side.

"In diabetes gastricus, where the hydro-carbons come into play, and where uncomplicated, I believe the rennet treatment will be found eminently successful. The mode I adopt and recommend of preparing the rennet is the following: The stomach of a calf (and the younger it is the better) is gently washed with water, taking care not to injure the mucous membrane; it is then well salted, tied up, and allowed to dry. After this, it is cut up into small pieces, macerated in a pint and a half or two pints of water, according to the size of the stomach, for four days, or longer in the winter, shaking it at intervals; the fluid is then poured off and bottled; and, to test its power, a spoonful may be added to a pint of warm milk, which if it curdles, it is now fit for use. Some stomachs are better than others, in which case the preparation is much stronger and more efficacious. This depends materially upon the honesty of the party from whom the bag may be procured; for I have been told by a respectable butcher that the parties who are in the habit of selling bags for this purpose not unfrequently take a dozen or so of stomachs, macerate them with salt and water, pour off the fluid, and dispose of it to farmers for dairy purposes; the stomachs are then tied up, and passed off as genuine first-hand articles. I may also call attention to a fact, well known to dairymaids, that after a thunderstorm rennet is useless to curdle milk; thus showing that a certain electric condition of the atmosphere exerts an influence upon the fluid. A little spirits, or decoction of sparrowgrass, may be added, to make it keep. The dose of rennet thus prepared is a tablespoonful, three, four, or six times in a day, usually about half an hour after each meal, and during the process of digestion, followed shortly after by an alkali, to neutralize the lactic acid formed. That which I recommend is the alkaline tribasic phosphate of soda; but the carbonate of potash will answer very well, either alone, or combined with the tincture of nux vomica, in five or ten drop doses. The nervous system in these cases seems at fault, and the nux vomica here serves as a stimulant and valuable tonic. In many of the cases treated, I have further recommended the inhalation of chlorine, from the power it possesses of destroying putrefaction and arresting the fermenting process. In all, I have now treated twenty-eight cases of diabetes by rennet, of which nineteen were males and nine females. Of the males were five gentlemen following no profession, two youths, one chandler, one labourer, one engineer, one wright, one ploughman, one policeman, and six farmers; females, one mill girl, three maid servants, and five domestic married females. Of these, seventeen were more or less connected with agricultural pursuits. The ages varied from eleven to sixty-five years; with three exceptions, all were in comfortable circumstances; eleven were in the habit of smoking, or using tobacco in the form of snuff; and although a few occasionally indulged to excess in alcoholic liquors, this was not by any means a general feature.

"The complications of most frequent occurrence I found to be phthisis; next, dysentery; and, lastly, anasarca, depending upon remote disease of the kidneys. The diet which I advise at first is strictly animal; and where the poverty of the patient does not permit of the free and generous use of the better quality of butcher meat or eggs, I recommend the heart, lung, liver, and kidneys to be substituted, as many good and savory dishes can be made from these organs; a soup made from the liver answers admirably in the troublesome constipation which accompanies this disease. Bread free from starch may be made as follows, according to the recommendation of Prout and Christison: Six eggs beat up, to which are added four ounces of butter; make into cakes with finely-ground bran. An excellent pudding is also made with curds, well washed, dried, and powdered—butter and eggs—which is salted and spiced to taste. Salted fish makes a good change, and does not increase the thirst so much as might be supposed. A variety of vegetables may be also given, as greens, kidney and French beans, and nettles even make an excellent dish, lettuce, artichokes, &c. As it is impossible to keep a patient for any length of time on a strictly animal diet without doing injury, I therefore add, after a little while, bran bread as found in the baker's, which I think quite equal to the gluten bread as it is made in this city, and much less expensive.

"If we consider the slow and insidious approach of diabetes, and that it generally has a firm footing before the patient is alarmed into taking advice upon his increasing symptoms, and that for weeks or months the true nature of his complaint may remain undetected even by the physician, we will not be surprised that it should take a considerable time to be entirely removed. The shortest period in which I have found sugar to disappear has been two weeks, the average from that to nine months. The importance of air and exercise cannot be over-estimated, as they are indispensably necessary to improve the general health. Hence I do not consider an infirmary a proper place for treating a diabetic patient. Attention to the functions of the skin is no less requisite, for which purpose the tepid bath, followed by friction, should be used, as also anointing the body with oil. The patient being usually melancholy, and a prey to gloomy apprehensions, it is of paramount importance to gain his confidence, and, if possible, infuse hope into his desponding heart. This the physician should know how and when to do in each respective case. In a word, nothing should be left untried which might tend either to improve or invigorate the body, or restore serenity and hope to the mind.

"Where diabetes is complicated with phthisis, I prescribe cod oil and morphine, and although I have never known such a case to recover, I have found such much benefited. I have also seen this disease follow as well as precede consumption. The preparation I have used with most success in such cases was a solution of phosphorus in chloroform, with the tincture of benzoin. Of the twenty-eight persons treated, seven have recovered; that is to say, they have regained the weight lost, their urine was diminished in quantity to about the usual standard, and contained no sugar, and they expressed themselves as being 'fit for their work, and in as good health as they ever were.' Three died; two from disease of the chest, and the other from dysentery, complicated with effusion of pus in the left pleura; and seven still remain under treatment. Of the remaining eleven, while I have lost sight of several from the fact that they were at considerable distance from town, I hold letters from others, expressing their thanks for benefit derived from the treatment. In thirteen of those cases, organic disease, and chiefly of the lungs, could be detected. I may finally remark that only a few of those cases had not been previously under the treatment of other medical men, so that there could be no mistake in the diagnosis."

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12. *Sugar in the Urine of Women in Childbed and while Nursing; and in some Women during Pregnancy.* By Dr. Hyppolyte Blot.—Up to the present time the presence of sugar in the urine has been considered by physicians as a pathognomonic sign of one of the gravest of maladies, diabetes. Numerous researches which I have engaged in, and which I have now the honour of bringing before the Academy, have furnished me with results which, at least in some degree, diminish the value of glucosuria as a diagnostic symptom of disease. In fact, it clearly appears from these researches, that sugar normally exists in the urine of all women in childbed, of all women while nursing, and of a certain number even during pregnancy.

I would say, in order to give more weight to the results which I have obtained, that in my investigation I have associated with myself, for the chemical part of the work, M. Reveil, Professor to the School of Pharmacy, and that in several instances I have had recourse to M. Bertholot, whose beautiful works on organic chemistry are well known. Most of the facts mentioned in the following extract have been, moreover, shown by me to a great number of physicians, and in particular to two members of the Academy, M. Rayer and M. C. Bernard.

In order to arrive at the demonstration of the fact which I announce, I have had recourse to all the means generally employed to detect sugar in a liquid. They have been used as follows: first, the urine experimented on has been treated by the test of the solution of copper and potass. The solution of Fehling has been always used, and to avoid all error, the urine has been previously treated with acetate of lead, in order to free it from the other matters which might interfere with the reaction of the test. For my later researches this mode of purification has been replaced by another still simpler, more expeditious, and one often employed by M. Claude Bernard in his experiments on glucogenesis; this consists in filtering through animal charcoal. As another reactive, I employed the caustic alkalies, potass and lime, which give with the urine a brown colour, more or less deep.

The third and principal means of proving the presence of sugar to which I have had recourse is the fermentation by the addition of yeast; and I have constantly obtained, on the one part, alcohol, easily recognized by its peculiar characters; and on the other, carbonic acid, readily absorbed by potass. I would add that I ascertained by experiment that the liquid residue of fermentation no longer was capable of reducing the copper in the solution of Fehling. Usually the process of fermentation (at a moderate temperature between 30° and 55°) took from twelve to twenty-four hours to be completed. Lastly, having slightly concentrated and perfectly discoloured the urine to be examined, I could see, thanks to the kindness of M. Bertholot, that this urine caused the plane of polarization to deviate to the right.

It thus appears that the main fact which I wish to establish cannot be doubted, viz., that sugar exists normally in the urine of all women in childbed, of all women when nursing, and of a considerable number of women during pregnancy. Since the urine of such persons presents all the characteristics which belong to urine containing sugar: 1st, reducing the copper in the cupro-potassic liquid of Fehling; 2d, turning brown when boiled with solution of caustic potash, or lime; 3d, yielding, on fermentation, alcohol and carbonic acid; 4th, causing polarized light to deviate to the right.